LA-UR-21-28248
Approved for public release; distribution is unlimited.

Title: FY22 ADAM Program Execution Plan LANL Inputs

Author(s): Ali, Alee Rizwan

Intended for: Report

Issued: 2021-08-17

FY22 ADAM Program Execution Plan

LANL Inputs

About the NSRC:

The National Security Research Center (NSRC) is Los Alamos National Laboratory's classified library. There are two groups associated with the NSRC, both of who work for LANL's Weapons Research Services (WRS) division (WRS-SIS and WRS-WMT). These groups are funded in part by the NNSA Archives Program. The NSRC's collections include tens of millions of documents from the Manhattan Project era through today. It is staffed with an expert, highly trained staff of librarians, archivists, digitizers, historians, and communications specialists. The NSRC traces its lineage to the wartime Technical Library created by J. Robert Oppenheimer during in 1943. Today, it supports a broad range of researchers within the LANL Weapons Program and beyond. The NSRC also has customers across other National Nuclear Security Administration labs and sites, and partners in the Department of Defense.

LANL Accomplishments

- **NNSA Defense Programs Award of Excellence:** The NSRC was awarded NNSA's Defense Programs Award of Excellence for "Significant contributions to the Stockpile Stewardship Program".
- **Titan on the Red (artificial intelligence/machine learning project):** Executed contract with vendor for both development and production licenses on the classified networks that will utilize AI/ML technologies to catalog and search the NSRC's digital collections.
    - System is in the process of being implemented on the classified networks.
    - Funding has been secured for FY22 to continue implementing Titan on the Red on the classified network.
    - Less than 10% of the NSRC's collections have been digitized and less than 10% of those digitized collections have been cataloged. Without this artificial intelligence / machine learning system to catalog and search the digitized collections, the digitized files are very difficult, and sometimes impossible, to find.
- **New Digitizing Lab:** Established a new high-speed digitization lab and team. This lab, the Rocky Flats Digitization Lab, is the seventh high-speed digitization lab the NSRC has stood up in the past 18-months. The lab is a large-scale paper digitization operation to support LANL's weapons production plutonium sustainment mission with the goal to digitize and make available the NSRC's Rocky Flats Collection.

- **Digitization:** Fully met the L2 milestones from the NNSA Archives Program. In addition, the following were accomplished:
    - Microfilm Digitization Lab: Completed the digitization and quality control of 265 weapons system microfilm reels four months ahead of scheduled deadline.
    - Rocky Flats Digitization Lab: Completed the digitization and quality control of 5,600 documents from the Rocky Flats Collection.
    - Plutonium Sustainment: Digitized and uploaded Weapons Production plutonium sustainment documents into the Online Vault.
- **Digitizing Equipment Certification:** Implemented a digitizing equipment certification program to guarantee all staff know how to operate the new high-speed equipment and the relevant standards to follow.
- **Bulk upload into Online Vault (OLV):** Developed and successfully tested a pilot for semi-automated cataloging, which involves bulk uploading large quantities of digitized documents to the OLV. The NSRC has bulk uploaded three collections and is working on two large-scale bulk uploads for the Las Vegas Vault and Field-Testing collections. The ramp up of the data load will begin in FY22.
- **Collaboration with LLNL:**
    - Nitrous Film: Collaborated with LLNL to test and determine if over 500 LANL motion picture films are nitrous cellulose. LLNL determined that there were only 68 nitrate films of this collection, thus reducing the hazard and easing the path to a long-term solution. This is a LANL project with assistance from LLNL.
    - Atmospheric Test Films: Shipped the final batch of about 6,000 unclassified motion picture atmospheric test films to LLNL to be digitized and analyzed to determine accurate yield calculations. This is a LLNL project with assistance from LANL.
- **Collaboration with Kansas City National Security Campus:**
    - LANL continued is successful multi-year collaboration with KCNSC. KCNSC is working on digitizing LANL's aperture card collection.
    - In FY21, KCNSC digitized over 22K aperture cards for LANL.
- **Classified Reports Collection Indexing:** This is a large-scale indexing project of one of the NSRC's most important collections. To date, 34,000 reports have been indexed, which represents about 50% of this large collection. In this project, the NSRC collaborated with several divisions across LANL who supplied volunteers to help index this collection. Project completion is estimated for the end of FY22.
- **Access to PDMLink/Windchill:** NSRC's librarians now have access to the LANL's PDMLink archives. This allows the NSRC to provide better support to LANL's weapons engineers. The NSRC's librarians can also now upload newly digitized material into PDMLink.
- **New Staff:**

- Hired 11 new archivists/librarians: These are a combination of new positions and replacements for staff who have retired. Nearly all of the hires have Masters in Library Science degrees.
- Hired 1 PhD level historian: This historian specializes in the history of computing.

- **Weapons Ontology Project:** Completed the final version of the Weapons Testing Ontology and the initial version of the Rocky Flats Ontology. These ontologies cover hundreds of terms with thousands of relationships between nuclear weapons designs, production, and testing terms. This ontology development was based on feedback from LANL scientists and engineers, and will be used support enhanced search systems, such as Titan on the Red.
- **Relocation of Film Media Collection:** Moved more than 30 pallets of boxes containing our film/video media collection from the NSRC's main VTR to six new VTR-certified transcontainers. The NSRC now has 14 transcontainer VTRs that hold motion picture film, radiographs, microfilm, microfiche, videos, photos, and negatives. This will all eventually be moved to our new storage building whenever that building gets approved and funded.
- **UK Program Audit**: Successfully completed the annual audit of our UK Collection.
- **New Shelving:** Received funding for new high-density shelving in the main NSRC VTR. This shelving will be installed in the large vault room from where we relocated the film media collection to the transcontainers. The shelving is paid for by the LANL weapons production directorate and will primarily house the Rocky Flats Collection.
- **Outreach:** The NSRC dedicated significant effort to strategic messaging through a variety of platforms in order to reach LANL Weapons Program researchers, and in particular the next generation of scientists and engineers, as well as partners in the DOE, the NNSA, the DoD, and other national laboratories. The goal is to increase awareness of the NSRC's collections and services. This work has led to an increased use of the NSRC's resources.
  - *The Vault* magazine: The first edition of NSRC's annual national security magazine was published; the second issue will be released in September 2021.
  - *Relics* podcast: The first season of a three-episode podcast that focuses on a unique artifact from LANL history was released. The second season is in production.
  - Trinity Test anniversary: Communications products, including documentary videos, stories, posters, and recorded presentations were produced by the NSRC to commemorate the scientific achievements of the detonation of the world's first atomic bomb.
  - Articles: An average of three to four articles per month in LANL's internal as well as external website showcasing the NSRC's collections.
  - Web events and presentations: Numerous webinars and in-person seminars where researched, developed, and conducted to highlight a variety of topics pertinent to the NNSA mission, which included nuclear safety incidents and the history of atmospheric testing. Participation in these events ranged from about 200 to over 1,000 across the Nuclear Security Enterprise.

- In-person tours of the NSRC: Conducted dozens of tours of the NSRC to build partnerships with LANL's internal staff of scientists and engineers, as well as external organizations from the DoD and NNSA labs.

- **Book publishing:** The NSRC published one book and is working on five others; all are based on the collections in the NSRC and highlight scientific and engineering accomplishments at Los Alamos in an effort to increase awareness for next-generation staff as well as preserve, and in some cases, correct, the historical narrative.
  - *The History of the National Security Research Center*: The evolution of what began as J. Robert Oppenheimer's technical library and is today's world-class research facility.
  - *The Nobel Laureates of the Los Alamos Manhattan Project*: An 18-chapter book that features a profile on and photos of each laureate who contributed to the Los Alamos mission during the Manhattan Project era.
  - *Of Clouds, Craters, and Codes*: This is the introductory volume in a series of atmospheric testing books being produced in partnership with LLNL.
  - *The History of the H-bomb*: An in-depth technical history of the development of the hydrogen bomb using previously unreleased material in the collections of the NSRC.
  - *The Trinity Test*: A coffee table book that narrates the dawn of the Atomic Age though one-of-a-kind photos, many of which have never before been published.
  - *The Operational History of Los Alamos National Laboratory*: The evolution of the LANL facilities that began with lab facilities that were built in secrecy nearly overnight on a remote mesa in northern New Mexico.

- **Customer Service Area:** The final phases of the work for our new customer service area are underway. This area will better allow the NSRC's librarians and archivists to discuss research request and share information with our customers.

LANL Process Improvements

- Developed and implemented a document digitization workflow that includes 100% quality control reviews of digitized documents and metadata and also includes derivative classification reviews.
- Developed and implemented a standardized document digitization process as well as an integrated process with archivists and Rocky Flats subject matter expert inputs for metadata collection.
- Developed and implemented a formal secure process to ship classified Rocky Flats boxes from one LANL location to another to ultimately accession the boxes into the NSRC.
- Implemented a standardized process to intake, assign, digitize, and collect metadata for multi-media (e.g., video, motion picture, microfiche, microfilm, large drawings) shipped to the main NSRC VTR from the Rocky Flats Digitization Lab.
- Rehoused classified and unclassified motion picture films into archival quality storage containers to preserve and extend their lifecycle.
- Developed and implemented a process to bulk upload digitized Weapons Production Sustainment documents into the OLV.
- Developed and implemented a standard materials management process throughout all the NSRC collections.
- Developed and deployed an application and a process to allow the OLV to bulk upload large volumes of documents and associated cataloging information. This will greatly accelerate making millions of digitized files available to researchers. These files are currently stored in shared drives and difficult to access.
- Numerous upgrades and enhancements to the applications, backend hardware infrastructure, access controls, searching, and backup and recovery strategies.
    - Upgraded the OLV OpenText Documentum software suite upgraded from V7.2 to V16.7.1.
    - Upgraded the Windows Server OS upgraded from V2012 to V2019.
    - Upgraded the Linux Server OS upgraded from RHEL V6 to RHEL V7.9.
    - Upgraded the Oracle Database upgraded from V12 to V19c.
    - Implemented the New Virtual Machine (VM) hosting hardware.
    - Increased and implemented a new scalable storage array.
    - Implemented Single Sign-On (SAML SSO) to eliminate the use of Crypto cards to log into the system.
    - Enabled “smart navigation” advanced search to aggregate the results by category and improve the full text searching performance.

- Implemented the capability to backup and recover on Cohesity server images to ensure the data are protected properly and, when called upon, the restoration process is more efficient.

LANL Planned Activities

- Implement Titan on the Red (LANL's AI/ML project) on the classified network by end of FY22.
- Begin process to integrate OLV's databases into Titan on the Red.
- Manage the operations and maintenance (O&M) of the OLV application and infrastructure by ensuring 100% of the staff are fully trained in the operations and maintenance of OLV system.
- Maintain the security of the OLV classified system by ensuring 100% of access controls protocols, security patches, and need-to-know procedures are in-place.
- Complete application enhancements in agreement between WRS division and the customer-base.
- Establish a second high-speed digitization lab to digitize programmatically important paper media outside the Rocky Flats Collection. The Rocky Flats Collection will continue to be digitized in the Rocky Flats Digitization Lab established in FY21.
- Continue to ramp up the digitization of the NSRC's microfilm and microfiche collections.
- Integrate the Weapons Program ontologies with Titan on the Red to increase understanding and discoverability of our weapons information for our customers.
- Continue bulk cataloging and uploading collections to the Online Vault, including the Rocky Flats Collection, engineering drawings collections, and additional portions of the field-testing collection.
- Implement a content management system for the NSRC. Migrate data from the classified reports indexing project into content management system to include an automated tracking process.
- Rehouse classified reports collection into archival quality storage containers to preserve and extend their lifecycle.
- Complete the indexing of the Classified Reports Collection.
- Explore digitizing the Classified Reports Collection and upload digital files to the OLV or equivalent.

LANL Challenges

Challenge	Mitigation Strategy
Difficult to predict if extended COVID-19 restrictions may continue to impact the NSRC's ability to deliver on-site services in a timely manner.	LANL will prioritize the work required by the librarians, archivists, digitizers, historians, and OLV developers/administrators to ensure the highest priority work is accomplished based on the needs of the LANL Weapons Program.

LANL Equipment

Make	Model	Media	Count
Mekel	MACH 7	Microfiche	4
Mekel	MACH 10	Microfilm	3
Context HD	ULTRA 6090	Large Format, E Size Drawings	1
Epson	Expression 1200XL	Photo negatives, radiographs	1
Fujitsu	7700	Paper sheet feeder & flat bed, max 11X17	4
Image Access	Bookeye4VS	Book scanner	1
Lasergraphics	Director	Motion picture film	2
Mekel	Uscan	Microfiche, microfilm, and aperture card reader/scanner	1
Kokak	I4250	Paper	5

LANL Summary of Data Captured

Media Type	Number Scanned in FY21	Total Scanned to Date	Approximate Total in Inventory
Videos	1,164	5,656	10,000
Aperture cards	22,521	362,860	880,000
Unclassified Motion Picture	139	2,228	14,000
Classified Motion Picture	140	1,131	6,000
Microfiche	629	3,684	200,000
Microfilm	244	294	30,000
Paper (ft^3)	3,001	3,187	40,000
Logbooks	70	252	100,000
Audio Cassettes	7	613	Hundreds

Appendix E

LANL:

1. Digitize 500 - 800 microfiche.
2. Digitize 100 - 200 microfilm.
3. Digitize 1,000 - 2,000 videos.
4. Digitize 500 - 800 motion picture films.
5. Digitize 13,000 - 20,000 aperture cards (contingent on Kansas City National Security Campus receiving funding for this work from the National Nuclear Security Administration and accepting the task).
6. Digitize 1,000 – 2,000 documents.
7. Maintain and improve the electronic repositories for existing and newly digitized nuclear security materials.